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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/728,845	12/08/2003	Yoko Mitarai	2003-1781	9235
513	7590	05/09/2006	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			MCNELIS, KATHLEEN A	
			ART UNIT	PAPER NUMBER
			1742	

DATE MAILED: 05/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/728,845

Applicant(s)

MITARAI ET AL.

Examiner

Kathleen A. McNelis

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 Feb 06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-14 is/are pending in the application.
- 4a) Of the above claim(s) 11-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9 and 10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/8/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Claims Status

Claims 9-14 are presented for examination. Claims 9 and 10 were elected for examination and claims 11-14 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected group, there being no allowable generic or linking claim.

Election/Restrictions

Applicant's election of claims 9 and 10 (Group I) in the reply filed on 21 February 2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Priority

Acknowledgment is made of applicant's claim for foreign priority based on an application filed in Japan on 02/02/1999. It is noted, however, that applicant has not filed a certified copy of the Japan 025540/1999 application as required by 35 U.S.C. 119(b).

DETAILED ACTION

Claim Rejections - 35 USC § 102

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 9 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gu et al. 1998.

Gu et al. 1998, "Microstructures and Compressive Properties of Ir-15Nb Refractory Superalloy Containing Nickel" discloses the results of research to replace between 10 and 50% of the Ir in an Ir-15 Nb alloy (pp. 723-724). Table 1 shows compositions of alloys tested in atomic percent. Examiner contends that the column labeled "N" is a typographical error and should read "Nb" based on the text description of an Ir-15Nb-XNi alloy (p. 723). The composition of alloys in this table range as follows:

- A) Nickel from 10 to 50 at%, which is within the claimed range of between 5 and 65 at %;
- B) Nb 15 at%, which is within the claimed range of between 5 and 20%; and
- C) Ir balance, which is from 35 to 75 at% which is within the claimed range of from 30 to 75 at%.

Gu et al. teaches that after homogenizing heat treatment, two of these alloys (A and B) retain a fcc + L1₂ microstructure while a third phase, including (Ni,Ir)₃Nb is also present in the two alloys with higher nickel content. From the isothermal section of Ir-Nb-Ni system at the heat treatment temperature of 1573K (Figure 2), it appears that alloys A, B, C and/or D contain between 20 and 80 % by volume L1₂ microstructure.

Alternatively, while Gu et al. does not disclose that the L1₂ is from 20 to 80% by volume, such would be expected in the absence of evidence to the contrary since the microstructure is disclosed as at least L1₂ precipitates in an fcc matrix and since the compositions are within the ranges claimed in the instant invention. Further, on Figure 2, Gu et al. shows the L1₂ precipitate and fcc matrix phases are dependent upon at least composition overall, indicating that the volume percent L1₂ is a result effective variable affected by overall composition and as such subject to optimization by one skilled in the art (see M.P.E.P 2144.05, II, B).

Claim 9 is rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Gu et al. 1999.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

Gu et al. 1999, "Microstructures and Compressive Properties of Ni alloyed Rh-15 at% Nb two-phase refractory superalloys" discloses the results of research to replace between 10 and 50%

of the Rh in an Rh-15 Nb alloy (pp. 45-47). The caption of Figure 2 shows compositions of alloys tested in atomic percent.

The composition of alloys in this table range as follows:

- A) Nickel from 10 to 50 at%, which is within the claimed range of between 5 and 65 at %;
- B) Nb 15 at%, which is within the claimed range of between 5 and 20%; and
- C) Rh balance 35 to 75 at% which is within the claimed range of from 30 to 75 at%.

Gu et al. teaches that two of these alloys (with $Ni \leq 30$) retain a fcc + $L1_2$ microstructure while a third phase is also present in alloys with higher nickel content (p. 46). From the isothermal section of Rh-Nb-Ni system at the heat treatment temperature of 1473K (Figure 1), it appears that alloys A, B, C and/or D contain between 20 and 80 % by volume $L1_2$ microstructure.

Alternatively, while Gu et al. does not disclose that the $L1_2$ is from 20 to 80% by volume, such would be expected in the absence of evidence to the contrary since the microstructure is disclosed as at least $L1_2$ precipitates in an fcc matrix and since the compositions are within the ranges claimed in the instant invention. Further, on Figure 1, Gu et al. shows the $L1_2$ precipitate and fcc matrix phase compositions are functions of at least overall alloy composition, indicating that the volume percent of $L1_2$ is a result effective variable affected by overall composition and as such subject to optimization by one skilled in the art (see M.P.E.P 2144.05, II, B).

Claim 10 is rejected under 35 U.S.C. 103(a) as obvious over Gu et al. 1999 or Gu et al. 1998 in view of Duhl et al. (U.S. Pat. No. 4,719,080) or Bradley, 1988.

Gu et al. 1999 or Gu et al. 1998 disclose superalloys of $L1_2$ precipitates in an fcc matrix with nickel, rhodium (Gu et al. 1999) or iridium (Gu et al. 1998) and niobium compositions within the ranges disclosed in the instant invention as discussed above regarding claim 9. Further, the

composition of niobium in Gu et al. 1999 and Gu et al. 1998 is 15 at% as discussed above, which is within the claimed range of from 3 to 15 at% in claim 10.

Gu et al. 1999 or Gu et al. 1998 does not disclose a superalloy also containing aluminum from 1-13%.

Duhl et al. teaches that aluminum added to nickel based superalloys (abstract) improves the resistance to oxidation and corrosion and strengthens the alloy (col. 2 lines 50-68). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add aluminum as taught by Duhl et al. to the alloy of Gu et al. 1998 or Gu et al. 1999 to improve the resistance to oxidation and corrosion and strengthen the alloy as taught by Duhl et al.

Alternatively, Bradley, 1988, teaches that aluminum or niobium added to a nickel-base superalloy cause precipitation of a second phase during heat treatment that increase the strength and hardness of the alloy (p. 27). It would have been obvious to one of ordinary skill in the art at the time the invention was made to add aluminum as taught by Bradley to the alloy of Gu et al. 1998 or Gu et al. 1999 to increase the strength and hardness of the alloy as taught by Bradley.

Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koizumi et al. (U.S. Pat. No. 6,071,470).

Koizumi et al. discloses a refractory superalloy of Ir or Rh with an additive element selected from a group including titanium, zirconium, hafnium, vanadium, niobium, tantalum and aluminum. The microstructure is fcc with an $L1_2$ precipitate wherein the additive element is between 2 and 22 atomic percent (abstract). The range of from 2 to 22 atomic % Ti, Zr, Hf, V Nb, or Ta overlaps with the claimed range of from 5 to 20 atomic % in claims 9 and 10. The range of from 2 to 22 atomic % aluminum overlaps with the claimed range of from 4 to 13% in claim 10. It would have been obvious to one of ordinary skill in the art at the time the invention was made to

add between 5 and 20 atomic % of at least 1 metal selected from the group including titanium, zirconium, hafnium, vanadium, niobium and/or tantalum, since Koizumi et al. teaches that the preferable range is between 2 to 22 atomic %. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to add between 4 and 13% aluminum since Koizumi et al. teaches that the preferable range is between 2 to 22 atomic %.

Koizumi et al. teaches that nickel may be partially substituted for Ir or Rh to reduce the specific gravity and cost of the superalloy (col. 2 lines 49-52). In examples, Koizumi et al. discloses alloys with 15% additive; balance Ir or Rh (col. 4 lines 1-20). The range of partial nickel substitution would therefore be limited to: from 0% to less than 85% (amount of Ir or Rh present), which overlaps the claimed range of from 5 to 65%. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Ni for Ir or Rh to reduce specific gravity and weight as taught by Koizumi et al. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute Ni such that the final content of Ni in the alloy represented between 5 and 65%, since Koizumi et al. discloses that the available range is between 0 to less than 85% as discussed above.

While Koizumi et al. does not disclose that the L₁₂ is from 20 to 80% by volume, such would be expected in the absence of evidence to the contrary since the microstructure is disclosed as L₁₂ precipitates in an fcc matrix and since the compositions closely match the instant invention.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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SUPERVISORY PATENT EXAMINER
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